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TABLE IV: PCT* leachability of geopolymerie vs hydroceramic concretes

	Hydroceramic	Geopolymer	Geopolymer	Geopolymer
Cure Conditions	200°C, 2 hours	200°C, 2 hours	90°C, 4 days	~20°C, 4 days
pH of leachate	10.7	11.3	11.7	12.3
% Na leached	7.1	9.6	21	52
% Cs leached	0.086	0.060	0.18	2.0
% nitrite leached	26	36	51	71
% nitrate leached	14	46	57	71

*samples crushed to pass 100 mesh screen (150 micron)- no lower size limit, powders leached with 10x as much 90°C distilled water,

ACIdoc

HLW & FD EIS PROJECT - (AR) PF
Control # DC-81

Dennis Donnelly
56 Tulane Ave.
Pocatello ID 83201

March 12, 2000

Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563
Attention: Public Comment: Idaho HLW & FD EIS

Mr. Wichmann,

Please accept this as my formal written commentary on DOE/EIS-0287D, the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement dated December 1999.

A fully acceptable solution to the problem of what to do with radioactive waste has never been implemented or even discussed. I will here present my thoughts on the subject.

A. Repository Location

81-1
X1 (7)

Because waste radioactive materials must be isolated from the biosphere and because water transport is the principal mechanism for migration (after carefully excluding tectonic activity), a truly dry location with no access to a water table must be chosen.

The current U.S. repository sites fail to meet the dual site-selection criteria: no tectonic activity and no water. In fact, no U.S. locations at all meet both these criteria. Have you seriously considered locations outside the United States? I would like to point out that according to the global seismic hazard map on the web at http://seismo.ethz.ch/GSHAP/ there are large regions in Africa that appear to be low seismic risk and presumably quite dry. In fact a line all the way across that continent at 20 degrees north latitude appears free of seismic hazard. I suggest serious negotiations (and serious resources) be engaged in this region for repository selection, characterization, and implementation.

I feel the Yucca Mountain site is totally unacceptable as a high-level waste repository due to the tectonic hazard there. The close proximity, geologically, to the phreatic eruption site at Ubehebe Crater in Death valley shows what I mean. This class of volcano has the potential to blow hundreds of cubic miles of earth into the sky, as it did just up the road, at the Crowley Lake / Mammoth Lakes area on the east side of the Sierra Nevada.

B. Waste Form

81-2 III.D.2.c(4) The physical/chemical structure of radioactive waste to be disposed of must meet demanding criteria of long-term stability and non-dispersability to ensure its safety in transport and disposal site. DOE has considered glass and concrete forms, but glass is not as stable as it needs to be: in a radiation environment, glass becomes friable and tends to break down into dispersable fine powder. So does concrete, even without radiation.

81-3 III.D.4(2) Have you considered crystalline silicon? Silicon is abundant in the earth's crust, and when high purity is not required, need not be too expensive. When molten, silicon is practically a universal solvent, meaning it could dissolve every piece of radioactive material you have. When it solidifies, even with dissolved impurities, it forms a stable permanent material. Large amounts of dissolved impurities would tend to be concentrated at the boundaries between the microcrystals upon cooling to a solid, and thus be subject to leaching over time, but this can be prevented by site selection which excludes water. Waste bearing silicon ingots should be mechanically stable over geologic time periods, period. Silicon crystal conducts heat very well.

Furthermore, the silicon approach is one which should remove the need to characterize all the different types of radioactive waste into separate classifications and treat them separately. All the waste should just go into the silicon ingots and thence to a safe repository.

81-4 II.A(2) I seriously ask that you leave NO radioactive wastes in Idaho or elsewhere in America, we just have no place for it that is long-term safe. So I request that you dig up, process into silicon ingots, and remove all the radioactive materials at the Idaho NRTS/INEL/INEEL site.

81-5 III.D.2.c(6) I request that you create a fully contained, mobile furnace that could safely create stable ingots from the radioactive waste here, and then move this furnace to the other sites and repeat the same process there. A containment structure to fully contain, filter and reprocess the offgases should be the only nonmovable structure involved. The EBRII dome could do this job.

Dennis Donnelly

Dennis Donnelly

CC: Blaine Edmo, Fort Hall Tribal Council
Anne Minard, Idaho State Journal

HLW & FD EIS PROJECT - (AR)PF
Control # DC-82

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
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IN REPLY REFER TO:

RECEIVED APR 21 2000

April 14, 2000

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Mr. T.L. Wichmann
U.S. Department of Energy
Idaho Operations Office
ATTN: Idaho HLW & FD EIS
850 Energy Drive, MS 1108
Idaho Falls, Id. 83401-1563

Dear Mr. Wichmann:

On March 14, 2000 the Department of the Interior (Department) sent you a letter, regarding the Draft Environmental Impact Statement for the Idaho High-Level Waste and Facilities Disposition, Idaho National Engineering and Environmental Laboratory (INEEL), Butte, Jefferson, Bingham and Bonneville Counties, Idaho, in which we stated that we did not have any comments to offer. Since that letter was sent the Department of Energy (DOE) extended the comment period and the Department is now providing the following comments for your use in preparing the Final Environmental Impact Statement. The March 14, 2000 no comment letter should be disregarded.

The Department has the following concerns regarding the air quality impact assessment for Yellowstone and Grand Teton National Parks (NP), and Craters of the Moon National Monument (NM), areas protected as Class I under the Clean Air Act:

82-1 VIII.B(2) 1) DOE should use the EPA CALPUFF modeling system at least in the "screening mode" to address impacts tc Class I increments and the NAAQS at Yellowstone and Grand Teton NPs.

82-2 VIII.B(2) 2) DOE should use the CALPUFF modeling system to address total deposition of sulfur and nitrogen to the three Class I areas.

82-3 VIII.B(2) 3) DOE should address far field visible haze impacts at the three Class I areas.

82-4 VIII.B(2) 4) All dispersion modeling for NPS areas as well as all other areas should use the on-site surface meteorological data with concurrent NWS upper air data.